AMENDMENTS TO THE CLAIMS

1-10. (Cancelled)

11. (Currently Amended) A method of determining the presence of target analytes in a sample comprising:

a) applying said sample to an array comprising a plurality of electrodes, ~~at least one of which~~wherein at least one electrode comprises an assay complex comprising:

i) a capture binding ligand covalently attached to said electrode;

ii) a target analyte; and

iii) an electron transfer moiety;

b) applying an input waveform to said electrode to generate an output waveform comprising at least one harmonic component, having a harmonic number greater than or equal to two;

c) detecting said output waveform at said electrode;

d) analyzing said harmonic component with harmonic number greater than or equal to two to determine the presence of said target analytes.

12-13. (Cancelled)

14. (Previously Amended) A method according to claim 11 wherein said target analyte is a nucleic acid.

15. (Withdrawn)

16-18. (Cancelled)

19. (Previously Amended) A method according to claim 11, wherein said analyzing comprises the use of a peak recognition scheme.

20. (Withdrawn)

21-27. (Cancelled)

28. (Previously Added) The method of claim 11, wherein said electrode has an asymmetrical response to said input waveform.

29. (Previously Added) The method of claim 28, wherein said electron transfer moiety is degradable.

30. (Previously Added) The method of claim 29, wherein said electron transfer moiety is luminol.

31-34. (Withdrawn)

35. (Cancelled)

36. (Previously Added) The method of claim 11, wherein said input waveform is a voltage waveform and said output waveform is a current waveform, wherein said input waveform comprises an AC component having a first frequency and a first amplitude, and wherein said first amplitude is selected such that said output waveform comprises at least one non-linear harmonic component.

37. (Currently Amended) The method of claim 11, wherein said harmonic component is chosen from the group of harmonic components consisting of ~~the~~ a second, third, fourth, fifth, sixth, seventh, eighth, ninth, and tenth harmonic components.

38. (Previously Added) The method of claim 11, wherein the output waveform comprises a plurality of harmonic components and said method comprises analyzing thea plurality of harmonic components ~~of said output waveform~~.

39. (Previously Amended) The method of claim 11, wherein said input waveform is a voltage waveform comprising a square wave.

40. (Previously Added) The method of claim 39, wherein said harmonic component is an even harmonic component.

41-42. (Withdrawn)

43. (Previously Added) The method of claim 11, wherein said input waveform comprises a plurality of components, each having a different frequency.

44. (Previously Added) The method of claim 11, further comprising fitting said harmonic component to a first curve and a second curve, wherein said first curve describes a Faradaic signal and said second curve describes a background signal.

45. (Previously Added) The method of claim 44, wherein said first curve is based, at least in part, on a modified Gaussian distribution.

46. (Previously Added) The method of claim 44, wherein said second curve is a fifth order polynomial.

47. (Previously Added) The method of claim 44, wherein said fitting comprises minimizing a mean square error.

48. (Currently Amended) The method of claim 46, wherein said fitting ~~said fifth order polynomial~~ comprises using singular value decomposition.

49-50. (Withdrawn)